

MICROPROCESSOR CONTROLLERS

Series 5000

For precise measurement and control of relative humidity, temperature and other linear processes such as CO₂, O₂, PSI, etc.

Features:

- ❑ **User friendly**
Easy installation
Simple Operation
- ❑ **High Accuracy**
Precision sensors
PID control
- ❑ **Humidity, Temperature & Humidity/Temperature versions**
- ❑ **Controls any linear process**
- ❑ **Single & dual controllers**
- ❑ **Ramp/Soak profiling**
- ❑ **90-240VAC operation**



Applications:

Many applications in research, testing, calibration, assembly and storage require the precise measurement and control of relative humidity, temperature and/or other processes in controlled environments. These requirements are found in virtually every industry including electronics, electrostatics, plastics, petrochemical, pharmaceutical, biomedical and personal care.

The ETS Series 5000 Microprocessor Controllers are a new family of controllers that meet the most demanding requirements. The universal design offers a wide choice of configurations that include single and dual control, ramp/soak profiling, analog or digital interfaces with optional software that will remotely control, chart, log and alarm. Precision sensors ensure accurate, long-term measurements of humidity, temperature or other linear parameters. The Controllers are designed for use with the ETS line of Controlled Environment Chambers and Humidity/Temperature Operating Systems plus chambers and operating systems from other manufacturers.

The Series 5000 Controllers are easy to use. Install the sensor, plug in the operating system power cords and select the set point. The controller will learn the process and then pulse AC power to the respective operating system to achieve precise control of the process.

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ets

Series 5000

Description:

The Series 5000 Controllers are highly flexible instruments that monitor and/or control not only humidity and temperature, but virtually any process measured with a sensor having a linear voltage output. The controllers operate from a common basic platform and are available in both single and dual control configurations. A dual controller can be configured for humidity and temperature or to control one parameter and only monitor the other. Interchangeable process identification labels are incorporated into the front panel overlay to identify the parameter being controlled. The controllers can operate either as "stand alone" units or as part of a computer-controlled system with the optional software package that can control, monitor and log up to 32 control modules simultaneously.

The controllers are available with a choice of two control modules that can be mixed or matched in the dual control units. The basic 3300 module continuously displays the measured parameter and when the function button is depressed, the set point. It can also perform a single ramp/soak cycle. The 9500P module displays the measured parameter and set point simultaneously, performs multiple ramp/soak cycles plus it has a third set point for alarming. Point source LED's in both modules indicate the operating status of the control function. Adding function control switches to the front panel allows the user to manually disconnect the respective operating systems without disturbing controller settings.

The controllers utilize solid state relays to provide power to standard North American AC outlets installed on the rear panel. IEC outlets for 115/230V are available as an option. Each module controls two power outlets; one for the increase and one for the decrease operating systems. For example: humidifier/dehumidifier or heater/cooling system. The instrument can be programmed as a simple ON/OFF controller, but is normally programmed to provide proportional control. In this mode the controller constantly monitors the respective process and updates the operating system characteristics to match those of the process being controlled. Power to the operating systems will then be pulsed at a rate that, depending on the sensor and operating system, is capable of maintaining the parameter, at the sensor, to within ± 0.2 of the set point. Slow responding sensors such as those used to measure CO₂ may require a lower resolution setting.

Humidity and humidity/temperature controllers are supplied with the ETS Model 554 Temperature Compensated Humidity Sensor that measures over the entire 0-100% RH range with an accuracy of $\pm 1.5\%$ RH. The sensor contains both capacitive humidity and RTD temperature sensing elements. Temperature compensation improves relative humidity measurement accuracy when the temperature is significantly above or below ambient (72°F/23°C).

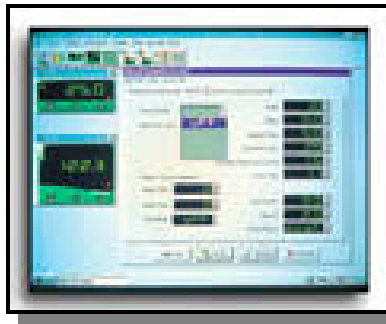
Temperature controllers are supplied with the ETS Model 555 Temperature Sensor. This fast responding, integrated circuit device with a linear voltage output of 1mv/°C measures over the range of 0-100°C (32-212°F) with an accuracy better than $\pm 1^\circ\text{C}$ (1.8°F). Thermocouple and RTD-2/Pt100 type sensors are available on special order.

Other process control sensors can either be supplied by ETS or provided by the user. They must be scalable to either 0-1v or up to 0-5V for use with 3300 and 9500P control modules respectively.

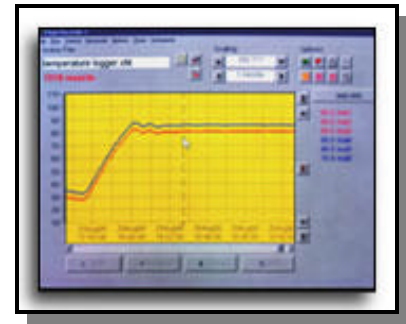
A 9-pin subminiature D COMM PORT provides an analog signal equal to the sensor output for connection to a recorder or data logger; or a digital output when the optional communications board is installed, to communicate with CALCOMMS Applications Software. Available on special order are CALgrafix Process Monitoring & Configuration and CALopc Server (for interfacing with OPC compatible client software) software packages that provide enhanced display, charting and alarming. Communication with computers running Windows 95/98/p2000/NT/XP uses the MODBUS protocol via a fully isolated RS-232 (single unit only) or RS-485 (multiple units) link for CALCOMMS. The graphic WINDOWS based software provides PC supervision of any combination up to 32 control modules with the capability of remote adjustment, instrument configuration, cloning, saving and retrieving instrument settings to files together with logging and charting. Up to 12 controller readings can be shown live on the screen in real time.



Controller Activity



Controller Configuration



Charting

Ordering

The Series 5000 Microprocessor Controllers can be ordered in the exact configuration required. The most common configurations are Humidity, Temperature, and Humidity/Temperature with 3300 control modules, function control switches and no communications interface board(s). The following model numbers specify the standard controller configurations. Any modifications to standard units will require building a model number using the chart below.

Model 5100-230 Temperature Controller

Model 5100-240 Humidity Controller

Model 5200-240 230 Humidity/Temperature Controller

BASE MODEL	LEFT CONTROLLER			RIGHT CONTROLLER		
	Controller Configuration	System Function	Computer Interface	Controller Configuration	System Function	Computer Interface
5 <input type="checkbox"/> 00	- <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 - Single Unit 1 CAL controllers	0 - 3300 Measure Only (No output relays & AC outlets)	1 - Universal (No parameter ID)	0 - No computer Interface board	0 - 3300 Measure Only (No output relays & AC outlets)	1 - Universal (No parameter ID)	0 - No computer Interface board
2 - Dual Unit 2 CAL controllers	1 - 3300 Standard Control w/o Operating system ON/ OFF switches	2 - CO ₂	1 - RS485 interface board	1 - 3300 Standard Control w/o Operating system ON/ OFF switches	2 - CO ₂	1 - RS485 interface board
	2 - 3300 Standard Control with Operating system ON/OFF switches	3 - Temperature	2 - RS232 interface board	2 - 3300 Standard Control with Operating system ON/OFF switches	3 - Temperature	2 - RS232 interface board
	3 - 9500P Ramp Control w/o operating system ON/OFF switches	4 - Humidity		3 - 9500P Ramp Control w/o operating system ON/OFF switches	4 - Humidity	
	4 - 9500P Ramp Control with operating system ON/OFF switches	5 - Pressure		4 - 9500P Ramp Control with operating system ON/OFF switches	5 - Pressure	
		(Other - number as needed)			(Other - number as needed)	

Specifications:

Controller:

3300

9500P

Sensor input (std linear):	0-1.0V	0-5V (max)
Accuracy:	±0.5%	±0.1%
Resolution:		±0.1 of digital readout
Calibration accuracy:		±0.25% (max sensor input)
Sampling frequency:		Input - 10 Hz, CJC - 2 sec
Display:		High Brightness LED
Reading:	0.4" (10mm) Green	0.4" (10mm) Green
Set Point:	Same as Reading	0.35" (9mm) Orange
SP1:		Flashing square Green
SP2:		Flashing round Red
SP3 (Alarm):	None	Flashing round Red
Controls:		
Control module:		Function, Up, Down buttons
Front Panel (Optional):		INCR - ON/OFF, DECR - ON/OFF
Power (Input):		90-240VAC, 50/60 Hz, 1,000 VA max
AC output control current:		
Std configuration:		4A
Heater Control:		8A
Solenoids:		2A (extra low turnoff leakage current)
Ramp/Soak:	1 cycle	126 seg./program, 31 programs, max
COMM PORT		
Analog Output:		0-1V directly from sensor
Communications:		MODBUS [®] protocol, Windows 95/98/2000/NT/XP, 200MHz/16MB RAM min (CALCOMMS only)
	Single unit link:	RS-232
	Multiple unit link:	RS-485
Dimensions:		7.25"Wx9.0"Dx2.5"H (185x229x70mm)
Weight:	3 lb (6.6kg)	3.5 lb (7.7kg)
Software:		
Standard support:		CALCOMMS Applications Software
Optional support:		CALgrafix Monitoring & Configuration Software CALopc Server Software

Sensors:

Humidity/Temperature:

Humidity:		Temperature compensated
Range:		Capacitive film
Accuracy:		0-100% (10mV/%RH)
Temperature:		±1.5% RH @ 73°F (23°C)
Range:		RTD
Accuracy:		-40 to +185°F (-40 to +85°C) (10mV/°C)
Size:		±0.36°F (0.2°C)
Cable length:		0.625" dia. x 6.5" L (15mm x 165mm)
Housing:		6.5' (2m)
Compliance:		Polycarbonate, black (Ral 7016)
		EN50081-2, EN50082-2
Temperature only:		Solid state IC
Range:		32-212°F (0-100°C) (10mV/°C)
Accuracy:		±1.8°F (1.0°C)
Size:		0.5" dia. x 2.5" L (12.5mm x 63mm)
Cable length:		5' (1.5m)
Housing:		Delrin, black

In accordance with ETS policy to improve our product line, the specifications cited above are subject to change without notice. 2/28/04



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